

ABSTRACT

A device includes an integrated circuit and a deposited tin in electrical contact with a portion of the integrated circuit. The deposited tin is formed by electrodeposition from a bath. The deposited tin includes a residue characteristic of the bath. The bath includes a bath-soluble tin compound, a strong acid, and a sulfopropylated anionic surfactant. In another aspect, a composition includes between approximately 20 and 40 grams per liter of one of stannous methane sulfonate, stannous sulfate, and a mixture thereof, between approximately 100 and 200 grams per liter of one of methanesulfonic acid, sulfuric acid, and a mixture thereof, and between approximately 1 and 2 grams per liter of one or more polyethyleneglycol alkyl-3-sulfopropyl diethers. In another aspect, a method includes electroplating tin with a current density of greater than approximately 30 mA/cm² and a plating efficiency of greater than approximately 95%.